

## CLAIMS:

1. A method of detecting a watermark in a multimedia signal being rendered by a computer system for display on a display screen connectable to said computer system, the method comprising the steps of:

- receiving the multimedia signal in the form of color signal components (R,G,B);
- converting said color signal components into a luminance signal (Y),
- detecting the watermark in said luminance signal.

2. A method as claimed in claim 1, wherein said step of converting comprises computing  $Y = R/4 + G/2 + B/8$ , where Y is said luminance signal and R, G and B are said color signal components.

3. A method as claimed in claim 2, in which the step of watermark detection includes:

15 - dividing a suspect image into areas corresponding to the size of a repeatedly embedded watermark pattern;

- accumulating said image areas; and
- detecting the watermark pattern in the accumulated image area;

wherein the method comprises:

20 - applying said steps of dividing and accumulating to each of said color signal components;

- applying the step of converting to the accumulated image areas to obtain an accumulated image area in luminance signal domain; and
- applying said step of detecting the watermark to the accumulated image area 25 in the luminance signal domain.

4. A method as claimed in claim 1, wherein said color signal components are red, green and blue, and said step of converting comprises selecting the green color signal component to constitute said luminance signal.

5. A method as claimed in claim 1, wherein the step of detecting the watermark comprises using a watermark detector being arranged to detect the watermark in a luminance signal having a predetermined resolution, the method further comprising the step of changing 5 the resolution of the multimedia signal to said predetermined resolution prior to said watermark detection.

6. A method of detecting a watermark in a multimedia signal being rendered by a computer system through a plurality of outputs each connectable to a display screen, 10 characterized in that the method comprises the step of time-sequentially connecting a watermark detector operating according to any of claims 1-5 to said plurality of outputs.

7. A computer system for rendering a multimedia signal method for display on a display screen via a display output of said computer system, the computer system comprising 15 a watermark detector connected to said display output, said watermark detector being arranged to:

20 - receive the rendered multimedia signal in the form of color signal components (R,G,B);  
- convert said color signal components into a luminance signal (Y),  
- detect the watermark in said luminance signal.

8. A computer system as claimed in claim 7, the computer system comprising a plurality of said display outputs each connectable to a display screen, characterized in that the computer system further includes means for time-sequentially connecting said watermark 25 detector to one of said plurality of outputs.

9. A graphics card for displaying a multimedia signal rendered by a computer system on a display screen via a display output of said graphics card, the graphics card comprising a watermark detector connected to said display output, said watermark detector 30 being arranged to:

- receive the rendered multimedia signal in the form of color signal components (R,G,B);  
- convert said color signal components into a luminance signal (Y),  
- detect the watermark in said luminance signal.

10. A graphics card as claimed in claim 9, the graphics card comprising a plurality of said display outputs each connectable to a display screen, characterized in that the graphics card further includes means for time-sequentially connecting said watermark detector to one  
5 of said plurality of outputs.

**AMENDED CLAIMS**

[received by the International Bureau on 26 January 2004 (26.01.04);  
original claims 1-10 replaced by new claims 1-8 (3 pages)]

1. A method of detecting a watermark in a multimedia signal being rendered by a computer system for display on a display screen connectable to said computer system, the method comprising the steps of:
  - receiving the multimedia signal in the form of color signal components (R,G,B);
  - 5 – dividing a suspect image of said multimedia signal into image areas in the respective color signal component domains, the image area size corresponding to the size of a repeatedly embedded watermark pattern;
  - accumulating the image areas in the same color signal domain to obtain an accumulated image area in the color signal component domain for each color signal component;
  - 10 – converting the accumulated image areas in the color signal component domains into an accumulated image area in a luminance signal domain;
  - detecting the watermark pattern in the accumulated image area in the luminance signal domain.
- 15 2. A method as claimed in claim 1, wherein said step of converting comprises computing  $Y = R/4 + G/2 + B/8$ , where Y is said luminance signal and R, G and B are said color signal components.
3. A method as claimed in claim 1, wherein the step of detecting the watermark 20 comprises using a watermark detector being arranged to detect the watermark in a luminance signal having a predetermined resolution, the method further comprising the step of changing the resolution of the multimedia signal to said predetermined resolution prior to said watermark detection.
- 25 4. A method of detecting a watermark in a multimedia signal being rendered by a computer system through a plurality of outputs each connectable to a display screen, characterized in that the method comprises the step of time-sequentially connecting a watermark detector operating according to any of claims 1-3 to said plurality of outputs.

5. A computer system for rendering a multimedia signal method for display on a display screen via a display output of said computer system, the computer system comprising a watermark detector connected to said display output, said watermark detector being

5 arranged to:

- receiving the multimedia signal in the form of color signal components (R,G,B);
- dividing a suspect image of said multimedia signal into image areas in the respective color signal component domains, the image area size corresponding to the size of a repeatedly embedded watermark pattern;
- 10 - accumulating the image areas in the same color signal domain to obtain an accumulated image area in the color signal component domain for each color signal component;
- converting the accumulated image areas in the color signal component domains into an accumulated image area in a luminance signal domain;
- detecting the watermark pattern in the accumulated image area in the luminance signal 15 domain.

6. A computer system as claimed in claim 5, the computer system comprising a plurality of said display outputs each connectable to a display screen, characterized in that the computer system further includes means for time-sequentially connecting said watermark 20 detector to one of said plurality of outputs.

7. A graphics card for displaying a multimedia signal rendered by a computer system on a display screen via a display output of said graphics card, the graphics card comprising a watermark detector connected to said display output, said watermark detector 25 being arranged to:

- receiving the multimedia signal in the form of color signal components (R,G,B);
- dividing a suspect image of said multimedia signal into image areas in the respective color signal component domains, the image area size corresponding to the size of a repeatedly embedded watermark pattern;
- 30 - accumulating the image areas in the same color signal domain to obtain an accumulated image area in the color signal component domain for each color signal component;
- converting the accumulated image areas in the color signal component domains into an accumulated image area in a luminance signal domain;

- detecting the watermark pattern in the accumulated image area in the luminance signal domain.

8. A graphics card as claimed in claim 7, the graphics card comprising a plurality of said display outputs each connectable to a display screen, characterized in that the graphics card further includes means for time-sequentially connecting said watermark detector to one of said plurality of outputs.